

## **STORM WATER MANAGEMENT PLAN**

Las Mansiones de Bonita  
3510 Tennis Court Lane  
Bonita, CA 91902  
San Diego County

### **PREPARED BY:**

Stuart Engineering  
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Job No. 312-07-04

### **FOR:**

Bonita Park Associates, LLC & Stivers Ranch, LLC  
3330 Bonita Road  
Chula Vista, CA 91910  
Attn: Tom Henry

**REVISED: July 30, 2008**  
**REVISED: February 1, 2008**  
September 7, 2007

**Storm Water Management Plan  
For Priority Projects  
(Major SWMP)**

Project Name:	Las Mansiones de Bonita
Permit Number (Land Development Projects):	5543
Work Authorization Number (CIP):	
Applicant:	Bonita Park Associates, LLC & Stivers Ranch, LLC
Applicant's Address:	3330 Bonita Road Chula Vista, CA 91910
Plan Prepared By <i>(Leave blank if same as applicant):</i>	Stuart Engineering
Date:	2-1-08
Revision Date (If applicable):	

The County of San Diego Watershed Protection, Storm Water Management, and Discharge Control Ordinance (WPO) (Ordinance No. 9424) requires all applications for a permit or approval associated with a Land Disturbance Activity must be accompanied by a Storm Water Management Plan (SWMP) (section 67.804.f). The purpose of the SWMP is to describe how the project will minimize the short and long-term impacts on receiving water quality. Projects that meet the criteria for a priority project are required to prepare a Major SWMP.

Since the SWMP is a living document, revisions may be necessary during various stages of approval by the County. Please provide the approval information requested below.

Project Review Stage	Does the SWMP need revisions?		If YES, Provide Revision Date
	YES	NO	

Instructions for a Major SWMP can be downloaded at <http://www.co.san-diego.ca.us/dpw/stormwater/susmp.html>.

Completion of the following checklist and attachments will fulfill the requirements of a Major SWMP for the project listed above.

**PROJECT DESCRIPTION**

Please provide a brief description of the project in the following box. .

This project proposes to subdivide two existing legal lots into five residential lots on a 5.32 acre site. The proposed Las Mansiones de Bonita is located on the northern side of Sweetwater Road where it intersects Tennis Court Lane, in the unincorporated area of Bonita, in the County of San Diego (see Vicinity Map).

To the south of the site is Sweetwater Road. To the north, east, and west of the site are existing residences. Traveling through the site, in the north-south direction, is the private road Tennis Court Lane. (See Attachment A).

### PRIORITY PROJECT DETERMINATION

Please check the box that best describes the project. Does the project meet one of the following criteria?

PRIORITY PROJECT	YES	NO
Redevelopment within the County Urban Area that creates or adds at least 5,000 net square feet of additional impervious surface area	X	
Residential development of more than 10 units		X
Commercial developments with a land area for development of greater than 100,000 square feet		X
Automotive repair shops		X
Restaurants, where the land area for development is greater than 5,000 square feet		X
Hillside development, in an area with known erosive soil conditions, where there will be grading on any natural slope that is twenty-five percent or greater, if the development creates 5,000 square feet or more of impervious surface		X
Environmentally Sensitive Areas: All development and redevelopment located within or directly adjacent to or discharging directly to an environmentally sensitive area (where discharges from the development or redevelopment will enter receiving waters within the environmentally sensitive area), which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10% or more of its naturally occurring condition.		X
Parking Lots 5,000 square feet or more or with 15 parking spaces or more and potentially exposed to urban runoff		X
Streets, roads, highways, and freeways which would create a new paved surface that is 5,000 square feet or greater		X

**Limited Exclusion:** Trenching and resurfacing work associated with utility projects are not considered priority projects. Parking lots, buildings and other structures associated with utility projects are subject to SUSMP requirements if one or more of the criteria above are met.

If you answered NO to all the questions, then **STOP**. Please complete a Minor SWMP for your project.

If you answered **YES** to any of the questions, please continue.

The following questions provide a guide to collecting information relevant to project stormwater quality issues. Please provide a description of the findings in text box below.

	QUESTIONS	COMPLETED	NA
1.	Describe the topography of the project area.	X	
2.	Describe the local land use within the project area and adjacent areas.	X	
3.	Evaluate the presence of dry weather flow.	X	
4.	Determine the receiving waters that may be affected by the project throughout the project life cycle (i.e., construction, maintenance and operation).	X	
5.	For the project limits, list the 303(d) impaired receiving water bodies and their constituents of concern.	X	
6.	Determine if there are any High Risk Areas (municipal or domestic water supply reservoirs or groundwater percolation facilities) within the project limits.		X
7.	Determine the Regional Board special requirements, including TMDLs, effluent limits, etc.		X
8.	Determine the general climate of the project area. Identify annual rainfall and rainfall intensity curves.	X	
9.	If considering Treatment BMPs, determine the soil classification, permeability, erodibility, and depth to groundwater.	X	
10.	Determine contaminated or hazardous soils within the project area.		X

Please provide a description of the findings in the following box.

The site varies in elevation from 136 to 116 feet above sea level and slopes in the southerly direction. The site is surrounded by residential lots. There is existing and proposed dry-weather flow on site due to irrigation. The site drains to the lower Sweetwater River which is not listed as an impaired water body. Annual rainfall for the site is approximately 2.6 inches with 6-hour and 50-year storm and soil classification for the site is "D" soil.

Complete the checklist below to determine if Treatment Best Management Practices (BMPs) are required for the project.

No.	CRITERIA	YES	NO	INFORMATION
1.	Is this an emergency project		X	If YES, go to 6. If NO, continue to 2.
2.	Have TMDLs been established		X	If YES, go to 5.

No.	CRITERIA	YES	NO	INFORMATION
	for surface waters within the project limit?		X	If NO, continue to 3.
3.	Will the project directly discharge to a 303(d) impaired receiving water body?		X	If YES, go to 5. If NO, continue to 4.
4.	Is this project within the urban and environmentally sensitive areas as defined on the maps in Appendix B of the <i>County of San Diego Standard Urban Storm Water Mitigation Plan for Land Development and Public Improvement Projects</i> ?	X		If YES, continue to 5. If NO, go to 6.
5.	Consider approved Treatment BMPs for the project.	X		If YES, go to 7.
6.	Project is not required to consider Treatment BMPs			Document for Project Files by referencing this checklist.
7.	End			

Now that the need for a treatment BMPs has been determined, other information is needed complete the SWMP.

## WATERSHED

Please check the watershed(s) for the project.

- |  |  |                                       |   |
|--|--|---------------------------------------|---|
| <input type="checkbox"/> San Juan              | <input type="checkbox"/> Santa Margarita | <input type="checkbox"/> San Luis Rey | <input type="checkbox"/> Carlsbad         |
| <input type="checkbox"/> San Dieguito          | <input type="checkbox"/> Penasquitos     | <input type="checkbox"/> San Diego    | <input type="checkbox"/> Pueblo San Diego |
| <input checked="" type="checkbox"/> Sweetwater | <input type="checkbox"/> Otay            | <input type="checkbox"/> Tijuana      |   |

Please provide the hydrologic sub-area and number(s)

Number	Name
909.12	La Nacion

Please provide the beneficial uses for Inland Surface Waters and Ground Waters. Beneficial Uses can be obtained from the Water Quality Control Plan for the San Diego Basin, which is available at the Regional Board office or at <http://www.swrcb.ca.gov/rwqcb9/programs/basinplan.html>.

SURFACE WATERS	Hydrologic Unit Basin Number	MUN	AGR	IND	PROC	GWR	FRESH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Inland Surface Waters	909.12	*		X					O	X		X		X		
Ground Waters	909.12	X	X	X												

X Existing Beneficial Use  
 0 Potential Beneficial Use  
 \* Excepted from Municipal

## POLLUTANTS OF CONCERN

Using Table 1, identify pollutants that are anticipated to be generated from the proposed priority project categories. Pollutants associated with any hazardous material sites that have been remediated or are not threatened by the proposed project are not considered a pollutant of concern.

**Table 1. Anticipated and Potential Pollutants Generated by Land Use Type**

Priority Project Categories	General Pollutant Categories								
	Sediments	Nutrients	Heavy Metals	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Detached Residential Development	X	X			X	X	X	X	X
Attached Residential Development	X	X			X	p <sup>(1)</sup>	p <sup>(2)</sup>	P	X
Commercial Development >100,000 ft <sup>2</sup>	p <sup>(1)</sup>	p <sup>(1)</sup>		p <sup>(2)</sup>	X	p <sup>(5)</sup>	X	p <sup>(3)</sup>	p <sup>(5)</sup>
Automotive Repair Shops			X	X <sup>(4)(5)</sup>	X		X		
Restaurants					X	X	X	X	
Hillside Development >5,000 ft <sup>2</sup>	X	X			X	X	X		X

Priority Project Categories	General Pollutant Categories								
	Sediments	Nutrients	Heavy Metals	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Parking Lots	p <sup>(1)</sup>	p <sup>(1)</sup>	X		X	p <sup>(1)</sup>	X		p <sup>(1)</sup>
Streets, Highways & Freeways	X	p <sup>(1)</sup>	X	X <sup>(4)</sup>	X	p <sup>(5)</sup>	X		
X = anticipated P = potential (1) A potential pollutant if landscaping exists on-site. (2) A potential pollutant if the project includes uncovered parking areas. (3) A potential pollutant if land use involves food or animal waste products. (4) Including petroleum hydrocarbons. (5) Including solvents.									

**Note:** If other monitoring data that is relevant to the project is available, Please include as Attachment C.

### CONSTRUCTION BMPs

Please check the construction BMPs that may be used. The BMPs selected are those that will be implemented during construction of the project. The applicant is responsible for the placement and maintenance of the BMPs selected.

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Silt Fence                            | <input checked="" type="checkbox"/> Desilting Basin                |
| <input checked="" type="checkbox"/> Fiber Rolls                           | <input checked="" type="checkbox"/> Gravel Bag Berm                |
| <input checked="" type="checkbox"/> Street Sweeping and Vacuuming         | <input type="checkbox"/> Sandbag Barrier                           |
| <input checked="" type="checkbox"/> Storm Drain Inlet Protection          | <input checked="" type="checkbox"/> Material Delivery and Storage  |
| <input checked="" type="checkbox"/> Stockpile Management                  | <input checked="" type="checkbox"/> Spill Prevention and Control   |
| <input checked="" type="checkbox"/> Solid Waste Management                | <input checked="" type="checkbox"/> Concrete Waste Management      |
| <input checked="" type="checkbox"/> Stabilized Construction Entrance/Exit | <input checked="" type="checkbox"/> Water Conservation Practices   |
| <input type="checkbox"/> Dewatering Operations                            | <input checked="" type="checkbox"/> Paving and Grinding Operations |
| <input checked="" type="checkbox"/> Vehicle and Equipment Maintenance     |  |

- ☐ Any minor slopes created incidental to construction and not subject to a major or minor grading permit shall be protected by covering with plastic or tarp prior to a rain event, and shall have vegetative cover reestablished within 180 days of completion of the slope and prior to final building approval.

### SITE DESIGN

To minimize stormwater impacts, site design measures must be addressed. The following checklist provides options for avoiding or reducing potential impacts during project planning. If

YES is checked, it is assumed that the measure was used for this project. If NO is checked, please provide a brief explanation why the option was not selected in the text box below.

	OPTIONS	YES	NO	N/A
1.	Can the project be relocated or realigned to avoid/reduce impacts to receiving waters or to increase the preservation of critical (or problematic) areas such as floodplains, steep slopes, wetlands, and areas with erosive or unstable soil conditions?			X
2.	Can the project be designed to minimize impervious footprint?	X		
3.	Conserve natural areas where feasible?	X		
4.	Where landscape is proposed, can rooftops, impervious sidewalks, walkways, trails and patios be drained into adjacent landscaping?	X		
5.	For roadway projects, can structures and bridges be designed or located to reduce work in live streams and minimize construction impacts?			X
6.	Can any of the following methods be utilized to minimize erosion from slopes:			
6.a.	Disturbing existing slopes only when necessary?	X		
6.b.	Minimize cut and fill areas to reduce slope lengths?	X		
6.c.	Incorporating retaining walls to reduce steepness of slopes or to shorten slopes?		X	
6.d.	Providing benches or terraces on high cut and fill slopes to reduce concentration of flows?			X
6.e.	Rounding and shaping slopes to reduce concentrated flow?		X	
6.f.	Collecting concentrated flows in stabilized drains and channels?	X		

Please provide a brief explanation for each option that was checked N/A or NO in the following box.

There are no problematic areas such as floodplains, steep slopes and wetlands within the project's site. This project does not propose any new roadways or bridges within live streams. The location of the new residences will reduce the potential for impact to the receiving waters, therefore no retaining walls, benches or terraces, or rounding of slopes is necessary.

If the project includes work in channels, then complete the following checklist. Information shall be obtained from the project drainage report.

**\*This project does not propose work in channels.**

No.	CRITERIA	YES	NO	N/A	COMMENTS
1.	Will the project increase velocity or volume of downstream flow?		X		If YES go to 5.
2.	Will the project discharge to unlined channels?		X		If YES go to 5
3.	Will the project increase potential sediment load		X		If YES go to 5.



No.	CRITERIA	YES	NO	N/A	COMMENTS
	of downstream flow?		X		
4.	Will the project encroach, cross, realign, or cause other hydraulic changes to a stream that may affect upstream and/or downstream channel stability?		X		If YES go to 7.
5.	Review channel lining materials and design for stream bank erosion.			X	Continue to 6.
6.	Consider channel erosion control measures within the project limits as well as downstream. Consider scour velocity.			X	Continue to 7.
7.	Include, where appropriate, energy dissipation devices at culverts.			X	Continue to 8.
8.	Ensure all transitions between culvert outlets/headwalls/wingwalls and channels are smooth to reduce turbulence and scour.			X	Continue to 9.
9.	Include, if appropriate, detention facilities to reduce peak discharges.			X	
10.	"Hardening" natural downstream areas to prevent erosion is not an acceptable technique for protecting channel slopes, unless predevelopment conditions are determined to be so erosive that hardening would be required even in the absence of the proposed development.			X	Continue to 11.
11.	Provide other design principles that are comparable and equally effective.	X			Continue to 12.
12.	End				

## SOURCE CONTROL

Please complete the following checklist for Source Control BMPs. If the BMP is not applicable for this project, then check N/A only at the main category.

BMP			YES	NO	N/A
1.	<b>Provide Storm Drain System Stenciling and Signage</b>				
	1 .a.	All storm drain inlets and catch basins within the project area shall have a stencil or tile placed with prohibitive language (such as: "NO DUMPING - DRAINS TO SWEETWATER RIVER") and/or graphical icons to discourage illegal dumping.	X		
	1 .b.	Signs and prohibitive language and/or graphical icons, which prohibit illegal dumping, must be posted at public access points along channels and creeks within the project area.			X
2.	<b>Design Outdoors Material Storage Areas to Reduce Pollution Introduction</b>				
	2.a.	This is a detached single-family residential project. Therefore, personal storage areas are exempt from this requirement.	X		

BMP			YES	NO	N/A
	2.b.	Hazardous materials with the potential to contaminate urban runoff shall either be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.			X
	2.c.	The storage area shall be paved and sufficiently impervious to contain leaks and spills.			X
	2.d.	The storage area shall have a roof or awning to minimize direct precipitation within the secondary containment area.			X
3.	<b>Design Trash Storage Areas to Reduce Pollution Introduction</b>				
	3.a.	Paved with an impervious surface, designed not to allow run-on from adjoining areas, screened or walled to prevent off-site transport of trash; or,		X	
	3.b.	Provide attached lids on all trash containers that exclude rain, or roof or awning to minimize direct precipitation.	X		
4.	<b>Use Efficient Irrigation Systems &amp; Landscape Design</b>				
	The following methods to reduce excessive irrigation runoff shall be considered, and incorporated and implemented where determined applicable and feasible.				
	4.a.	Employing rain shutoff devices to prevent irrigation after precipitation.	X		
	4.b.	Designing irrigation systems to each landscape area's specific water requirements.	X		
	4.c.	Using flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.	X		
	4.d.	Employing other comparable, equally effective, methods to reduce irrigation water runoff.	X		
5.	<b>Private Roads</b>				
	The design of private roadway drainage shall use at least one of the following				
	5.a.	Rural swale system: street sheet flows to vegetated swale or gravel shoulder, curbs at street corners, culverts under driveways and street crossings.		X	
	5.b.	Urban curb/swale system: street slopes to curb, periodic swale inlets drain to vegetated swale/biofilter.		X	
	5.c.	Dual drainage system: First flush captured in street catch basins and discharged to adjacent vegetated swale or gravel shoulder, high flows connect directly to storm water conveyance system.		X	
	5.d.	Other methods that are comparable and equally effective within the project.	X		
6.	<b>Residential Driveways &amp; Guest Parking</b>				
	The design of driveways and private residential parking areas shall use one at least of the following features.				
	6.a.	Design driveways with shared access, flared (single lane at street) or wheelstrips (paving only under tires); or, drain into landscaping prior to discharging to the storm water conveyance system.	X		
	6.b.	Uncovered temporary or guest parking on private residential lots may be: paved with a permeable surface; or, designed to drain into landscaping prior to discharging to the storm water conveyance system.	X		
	6.c.	Other features which are comparable and equally effective.	X		
7.	<b>Dock Areas</b>				

BMP		YES	NO	N/A
	Loading/unloading dock areas shall include the following.			
7.a.	Cover loading dock areas, or design drainage to preclude urban run-on and runoff.			X
7.b.	Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.			X
7.c.	Other features which are comparable and equally effective.			X
8.	<b>Maintenance Bays</b>			
	Maintenance bays shall include the following.			
8.a.	Repair/maintenance bays shall be indoors; or, designed to preclude urban run-on and runoff.			X
8.b.	Design a repair/maintenance bay drainage system to capture all wash water, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.			X
8.c.	Other features which are comparable and equally effective.			X
9.	<b>Vehicle Wash Areas</b>			
	Priority projects that include areas for washing/steam cleaning of vehicles shall use the following.			
9.a.	Self-contained; or covered with a roof or overhang.			X
9.b.	Equipped with a clarifier or other pretreatment facility.			X
9.c.	Properly connected to a sanitary sewer.			X
9.d.	Other features which are comparable and equally effective.			X
10.	<b>Outdoor Processing Areas</b>			
	Outdoor process equipment operations, such as rock grinding or crushing, painting or coating, grinding or sanding, degreasing or parts cleaning, waste piles, and wastewater and solid waste treatment and disposal, and other operations determined to be a potential threat to water quality by the County shall adhere to the following requirements.			
10.a.	Cover or enclose areas that would be the most significant source of pollutants; or, slope the area toward a dead-end sump; or, discharge to the sanitary sewer system following appropriate treatment in accordance with conditions established by the applicable sewer agency.			X
10.b.	Grade or berm area to prevent run-on from surrounding areas.			X
10.c.	Installation of storm drains in areas of equipment repair is prohibited.			X
10.d.	Other features which are comparable or equally effective.			X
11.	<b>Equipment Wash Areas</b>			
	Outdoor equipment/accessory washing and steam cleaning activities shall be.			
11.a.	Be self-contained; or covered with a roof or overhang.			X
11.b.	Be equipped with a clarifier, grease trap or other pretreatment facility, as appropriate.			X
11.c.	Be properly connected to a sanitary sewer.			X
11.d.	Other features which are comparable or equally effective.			X
12.	<b>Parking Areas</b>			
	The following design concepts shall be considered, and incorporated and implemented where determined applicable and feasible by the County.			
12.a.	Where landscaping is proposed in parking areas, incorporate landscape areas into the drainage design.			X

BMP			YES	NO	N/A
	12.b.	Overflow parking (parking stalls provided in excess of the County's minimum parking requirements) may be constructed with permeable paving.			X
	12.c.	Other design concepts that are comparable and equally effective.			X
13.	<b>Fueling Area</b>				
	Non-retail fuel dispensing areas shall contain the following.				
	13.a.	Overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area. The fueling area shall drain to the project's treatment control BMP(s) prior to discharging to the storm water conveyance system.			X
	13.b.	Paved with Portland cement concrete (or equivalent smooth impervious surface). The use of asphalt concrete shall be prohibited.			X
	13.c.	Have an appropriate slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of urban runoff.			X
	13.d.	At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.			X

Please list other project specific Source Control BMPs in the following box. Write N/A if there are none and briefly explain.

N/A – This is a single family residential development. All the selected source control BMP's will help reduce pollution at the source to the Maximum Extent Practicable (MEP).

## TREATMENT CONTROL

To select a structural treatment BMP using Treatment Control BMP Selection Matrix (Table 2), each priority project shall compare the list of pollutants for which the downstream receiving waters are impaired (if any), with the pollutants anticipated to be generated by the project (as identified in Table 1). Any pollutants identified by Table 1, which are also causing a Clean Water Act section 303(d) impairment of the receiving waters of the project, shall be considered primary pollutants of concern. Priority projects that are anticipated to generate a primary pollutant of concern shall select a single or combination of stormwater BMPs from Table 2, which **maximizes pollutant removal** for the particular primary pollutant(s) of concern.

Priority projects that are **not** anticipated to generate a pollutant for which the receiving water is Clean Water Act Section 303(d) impaired shall select a single or combination of stormwater BMPs from Table 2, which are effective for pollutant removal of the identified secondary pollutants of concern, consistent with the "maximum extent practicable" standard.

**Table 2. Treatment Control BMP Selection Matrix**

Pollutant of Concern	Treatment Control BMP Categories						
	Biofilters	Detention Basins	Infiltration Basins <sup>(2)</sup>	Wet Ponds or Wetlands	Drainage Inserts	Filtration	Hydrodynamic Separator Systems <sup>(3)</sup>
Sediment	M	H	H	H	L	H	M
Nutrients	L	M	M	M	L	M	L
Heavy Metals	M	M	M	H	L	H	L
Organic Compounds	U	U	U	M	L	M	L
Trash & Debris	L	H	U	H	M	H	M
Oxygen Demanding Substances	L	M	M	M	L	M	L
Bacteria	U	U	H	H	L	M	L
Oil & Grease	M	M	U	U	L	H	L
Pesticides	U	U	U	L	L	U	L

(1) Copermitees are encouraged to periodically assess the performance characteristics of many of these BMPs to update this table.

(2) Including trenches and porous pavement.

(3) Also known as hydrodynamic devices and baffle boxes.

L: Low removal efficiency:  
M: Medium removal efficiency:  
H: High removal efficiency:  
U: Unknown removal efficiency

Sources: *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* (1993), *National Stormwater Best Management Practices Database* (2001), *Guide for BMP Selection in Urban Developed Areas* (2001), and *Caltrans New Technology Report* (2001).

A Treatment BMP must address runoff from developed areas. Please provide the post-construction water quality values for the project. Label outfalls on the BMP map.  $Q_{wq}$  is dependent on the type of treatment BMP selected for the project.

Outfall	Tributary Area (acres)	$Q_{100}$ (cfs)	$Q_{wq}$ (cfs)
105	0.21	0.71	0.02
265	2.70	6.64	0.25
460	3.0	7.92	0.28

} 85% Removal - See Attachment C

See Drainage Study by separate cover prepared by Stuart Engineering (September 7, 2007).

Please check the box(s) that best describes the Treatment BMP(s) selected for this project.

#### Biofilters

- ☒ Grass swale  
☐ Grass strip  
☐ Wetland vegetation swale  
☐ Bioretention

#### Detention Basins

- ☐ Extended/dry detention basin with grass lining  
☐ Extended/dry detention basin with impervious lining

**Infiltration Basins**

- ☐ Infiltration basin
- ☐ Infiltration trench
- ☐ Porous asphalt
- ☐ Porous concrete
- ☐ Porous modular concrete block

**Wet Ponds or Wetlands**

- ☐ Wet pond/basin (permanent pool)
- ☐ Constructed wetland

**Drainage Inserts** (See note below)

- ☐ Oil/Water separator
- ☐ Catch basin insert
- ☐ Storm drain inserts
- ☐ Catch basin screens

**Filtration**

- ☐ Media filtration
- ☐ Sand filtration

**Hydrodynamic Separator Systems**

- ☐ Swirl Concentrator
- ☐ Cyclone Separator
- ☐ Baffle Separator
- ☐ Gross Solids Removal Device
- ☐ Linear Radial Device

**Note:** Catch basin inserts and storm drain inserts are excluded from use on County maintained right-of-way and easements.

Include Treatment Datasheet as Attachment E. The datasheet should include the following:		COMPLETED	NO
1.	Description of how treatment BMP was designed. Provide a description for each type of treatment BMP.	X	
2.	Engineering calculations for the BMP(s)		X

Please describe why the selected treatment BMP(s) was selected for this project. For projects utilizing a low performing BMP, please provide a detailed explanation and justification.

Grass swales and construction desiltation basins were selected for this project. These two BMPs will provide the best natural treatment of runoff as well as regulating the volume amount discharged.

**MAINTENANCE**

Please check the box that best describes the maintenance mechanism(s) for this project.

CATEGORY	SELECTED	
	YES	NO
First	X	
Second		
Third		
Fourth		

Please briefly describe the long-term fiscal resources for the selected maintenance mechanism(s).

The onsite BMPs will fall under category one maintenance. The owner will have the obligation to privately maintain all BMPs, otherwise the County, under the Municipal Permit, will be able to enforce compliance through the use of fines.

## ATTACHMENTS

Please include the following attachments.

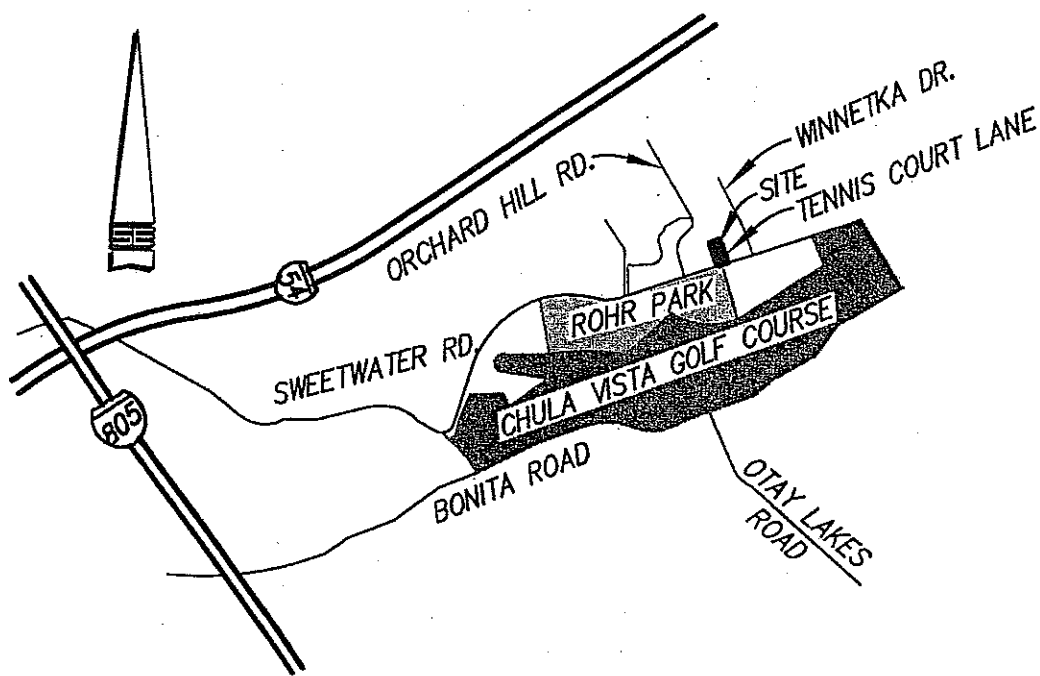
ATTACHMENT		COMPLETED	N/A
A	Project Location Map/Vicinity Map	X	
B	LID and Treatment BMP Location Map	X (PGP)	
C	Treatment BMP Datasheets	X	
D	Operation and Maintenance Program for Treatment BMPs	X	
E	Engineer's Certification Sheet	X	

F:\ADMIN\312\CL5343R.DOC

**ATTACHMENT A**

**LOCATION MAP**





**VICINITY MAP**  
NO SCALE

## **ATTACHMENT B**

### **PRELIMINARY GRADING PLAN (POCKET)**

**ATTACHMENT C**

**TREATMENT BMP DATA SHEETS**

1/4/08

LAS MANSIONES DE BONITA

SE JOB #312-07-05

$$Q_{WQ} = CIA$$

C = RUNOFF COEFFICIENT

I = RAINFALL INTENSITY (INCH/HR)

A = AREA (ACRES)

$$C = 0.46 \quad (\text{AVERAGE RUNOFF COEFFICIENT})$$

$$I = 0.2 \quad (\text{FROM COUNTY OF SAN DIEGO SOSMP MANUAL, PRINCIPLE 8, FLOW METHOD 2.i})$$

OUTFALL

$$105 \quad Q = (0.46)(0.2)(0.21) = 0.02 \text{ cfs}$$

$$265 \quad Q = (0.46)(0.2)(2.70) = 0.25 \text{ cfs}$$

$$460 \quad Q = (0.46)(0.2)(3.0) = 0.28 \text{ cfs}$$

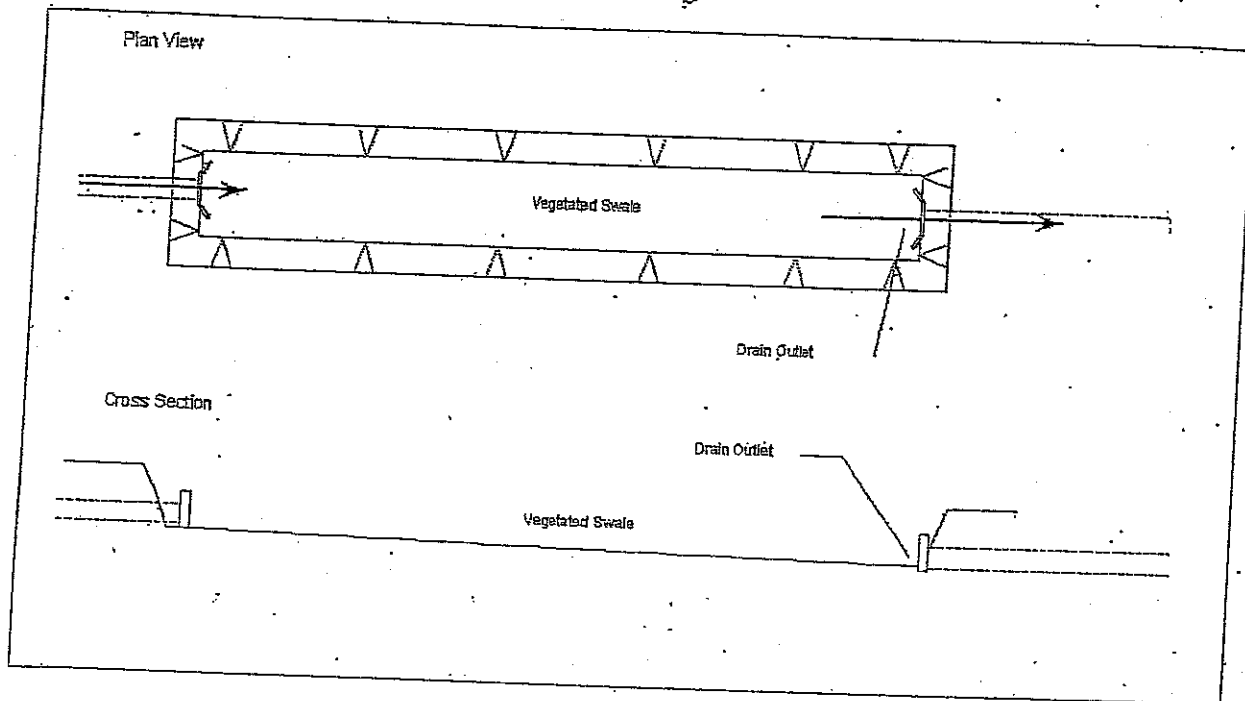


Figure 3.3.1  
Example of Bio-filter Schematic

Table 3.3.1: Summary Of Bio-filtration Design Factors (Strips And Swales)

Description	Applications/Siting	Preliminary Design Factors
<p>Swales are vegetated channels that receive and convey storm water.</p> <p>Strips are vegetated buffer strips over which storm water flows as sheet flow.</p> <p>Treatment Mechanisms:</p> <ul style="list-style-type: none"> <li>• Filtration through the grass</li> <li>• Sedimentation</li> <li>• Adsorption to soil particles</li> <li>• Infiltration</li> </ul> <p>Pollutants removed:</p> <ul style="list-style-type: none"> <li>• Debris and solid particles</li> <li>• Some dissolved constituents</li> </ul>	<ul style="list-style-type: none"> <li>• Site conditions and climate allow vegetation to be established</li> <li>• Flow velocities not high enough to cause scour</li> </ul>	<ul style="list-style-type: none"> <li>• Swales sized as a conveyance system (per County flood routing and scour procedures)</li> <li>• Swales sized as a conveyance system (per County flood routing and scour procedures)</li> <li>• Swale water depth as shallow as the site will permit</li> <li>• Strips sized as long (in direction of flow) and flat as the site allows</li> <li>• Strips should be free of gullies or rills</li> <li>• No minimum dimensions or slope restrictions for treatment purposes</li> <li>• Vegetation mix appropriate for climates and location</li> </ul>

## 5.0 BEST MANAGEMENT PRACTICES FOR STORM WATER RUNOFF DETENTION/RETENTION

the installation of curbs and gutters in new developments for a variety of reasons including ease of maintenance, on-street parking, sidewalk installation, interface with drainage systems, and traffic confinement. While curb and gutter systems possess a number of obvious advantages, they also have some significant disadvantages, related to runoff quantity and quality, which are not so obvious because the impact is felt away from the site, downstream.

Curb and gutter systems have the effect of turning streets into paved channels. All of the rainfall which falls on or enters the street becomes runoff which is routed quickly to receiving streams with little or no opportunity for infiltration. The increased runoff volume and decreased travel time cause increased flow peaks downstream which can result in frequent flooding and stream channel degradation. In addition, all of the particulate matter which accumulates on street surfaces is available for washoff, causing significant runoff quality degradation.

Grassed roadside ditches or swales can reduce the adverse impacts of street runoff by reducing the flow velocities, providing some detention storage capacity, allowing heavy particulate matter to fall out, and creating an opportunity for infiltration to occur. The drawing at the end of this practice shows a comparison of a curb and gutter vs. a swale drainage system.

In planning future street drainage systems, project planners, engineers, and government officials should weigh heavily the offsite advantages of using grassed swales instead of curb and gutter systems. The following additional considerations should also be taken into account:

1. Vegetated swales are generally less expensive to install than curb and gutter systems.
2. Roadside ditches keep flow away from the street surface during rainstorms, reducing the potential for hydroplaning of auto tires and for wet brake linings.
3. Vegetated channels may require more maintenance than curb and gutter systems (mowing, seeding, debris removal, erosion and sediment control, etc.).
4. Roadside ditches are subject to damage due to snow-plowing and off-street parking.
5. Streets with swales may require more right-of-way and be less compatible with sidewalk systems.
6. Roadside ditches become less feasible as the number of driveway entrances requiring culverts increases.
7. Roadside ditches can be used in conjunction with infiltration trenches and pits (BMP 5.2.2) to further attenuate runoff and improve its quality.

### **Grass Filter Strips**

Strips of close growing grasses can be established at the perimeter of disturbed or impervious areas to intercept runoff in sheet flow and remove particulate contaminants.

## 5.0 BEST MANAGEMENT PRACTICES FOR STORM WATER RUNOFF DETENTION/RETENTION

The vegetation slows the sheet flow, causing heavier particles to fall out. Infiltration is also enhanced.

Table 5.2.5-1 illustrates removal efficiencies of grass and grass-soil filters for some pollutants common in runoff. Although the effectiveness data shown cannot be directly applied to swale drainage effectiveness (due to assumed greater velocities of flow), they do illustrate that the routing of runoff over vegetated areas can substantially improve its quality. In another example, research on construction sites has shown that a minimum of 85% sediment removal will result with an 8' grass strip used with shallow flow. Other research has shown that the best performance in vegetative stripping can be achieved by using tall, dense stands of turf-forming grasses.

Table 5.2.5-1  
**REDUCTION OF POLLUTANTS THROUGH  
THE UTILIZATION OF GRASS AND GRASS-SOIL FILTERS**

<u>Pollutant</u>	<u>Percent Reduction<sup>a</sup></u>	
	<u>Grass</u>	<u>Grass-soil</u>
COD	19	88
SS (suspended solids)	34	99.6
VSS (volatile suspended solids)	26	97
Turbidity	97	98
Total coliforms	84	98
Fecal coliforms	50	98

<sup>a</sup> "Grass" refers to the effect of grass alone; "Grass-soil" refers to the effect of both the grass and underlying soil.

Source: Wisconsin Department of Natural Resources

### **Seepage Areas**

Seepage areas may be created by excavating shallow depressions in the land surface or by constructing a system of dikes or berms to temporarily pond water over permeable soils. They are generally limited to use below small drainage areas due to their space requirements. Collecting and infiltrating runoff from small paved areas and rooftops are typical applications.

Seepage areas should be used only where soils have moderate to high permeability; otherwise standing water may become a problem. Soil percolation rates of at least 0.6" per hour are recommended (see Appendix A for soil permeabilities). It is also recommended that seepage areas be lined with dense turf grass which will facilitate infiltration, provide some pollutant uptake, create an attractive landscape and allow for other uses of the area during dry weather

## **ATTACHMENT D**

### **OPERATION AND MAINTENANCE PROGRAM FOR TREATMENT BMPS**



# **LAS MANSIONES DE BONITA**

<b>PROPOSED OPERATION AND MAINTENANCE PROGRAM DETAILS</b>					
O&M RESPONSIBLE PARTY DESIGNEE: HOMEOWNER					
	INSPECTION FREQUENCY	MAINTENANCE FREQUENCY	MAINTENANCE METHOD	SERVICE FREQUENCY	SERVICE METHOD
<b>POST-CONSTRUCTION PERMANENT BMP'S</b>					
TRASH PICK UP	WEEKLY	WEEKLY	TRUCK PICK UP	AS-NECESSARY	WASH
SWEEPING	WEEKLY	MONTHLY	HAND/TRUCK SWEEPING	YEARLY	REPAIR PMT.
LANDSCAPE MAINTENANCE	WEEKLY	WEEKLY	MANUAL LABOR	MONTHLY	ADJUST EQUIP.
FERTILIZING	MONTHLY	BI-ANNUALLY	APPLY	YEARLY	SPOT APPLICATION
BIO-SWALE MAINTENANCE	WEEKLY	AS NECESSARY	MANUAL LABOR	WEEKLY	GRASS TRIMMING

**ATTACHMENT E**

**ENGINEER'S CERTIFICATION SHEET**

This Stormwater Management Plan has been prepared under the direction of the following Registered Civil Engineer. The Registered Civil Engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.

*Brian S Faraci*

BRIAN FARACI  
R.C.E. 34618

*7-30-08*

DATE



**ATTACHMENT F**

**LOW IMPACT DEVELOPMENT (LID) CHECK LIST**

## LOW IMPACT DEVELOPMENT (LID)

Each numbered item below is a LID requirement of the WPO. Please check the box(s) under each number that best describes the Low Impact Development BMP(s) selected for this project.

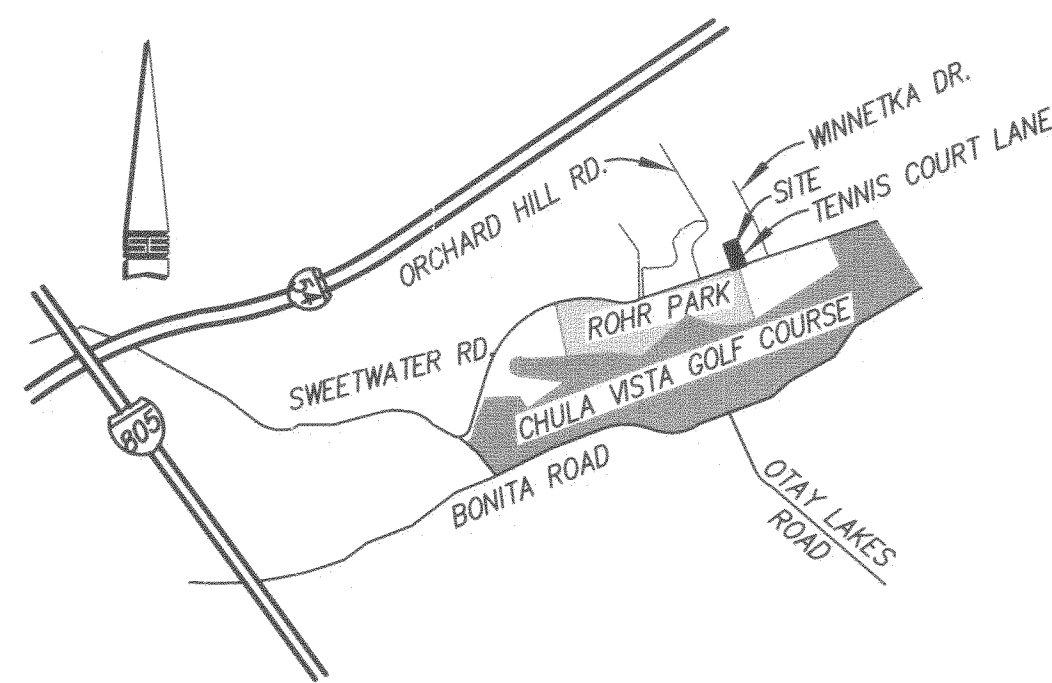
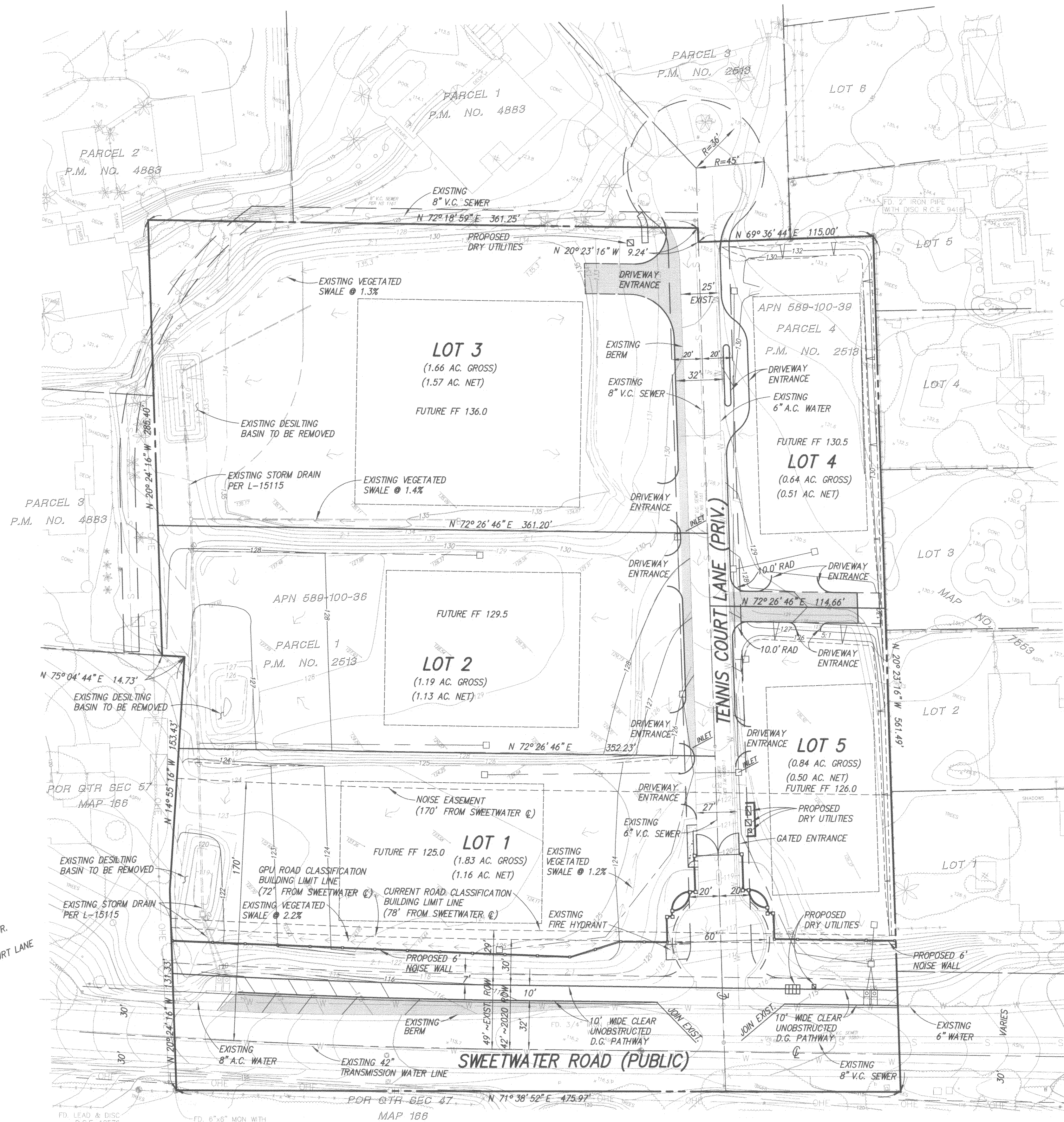
Table 8

1. Conserve natural Areas, Soils, and Vegetation-County LID Handbook 2.2.1
<input type="checkbox"/> Preserve well draining soils (Type A or B)
<input type="checkbox"/> Preserve Significant Trees
<input type="checkbox"/> Other. Description:
<input checked="" type="checkbox"/> 1. Not feasible. State Reason: THE PROJECT WAS ALREADY MASS-GRADED PER GRADING PERMIT L-15115.
2. Minimize Disturbance to Natural Drainages-County LID Handbook 2.2.2
<input type="checkbox"/> Set-back development envelope from drainages
Restrict heavy construction equipment access to planned green/open space areas
<input type="checkbox"/> Other. Description:
<input checked="" type="checkbox"/> 2. Not feasible. State Reason: THE PROJECT WAS ALREADY MASS-GRADED PER GRADING PERMIT L-15115.
3. Minimize and Disconnect Impervious Surfaces (see 5) -County LID Handbook 2.2.3
<input type="checkbox"/> Clustered Lot Design
<input type="checkbox"/> Items checked in 5?
<input checked="" type="checkbox"/> Other. Description: IMPERVIOUS SURFACES ON-SITE WILL DIRECT RUNOFF INTO LANDSCAPING WHERE FEASIBLE.
<input type="checkbox"/> 3. Not feasible. State Reason:
4. Minimize Soil Compaction-County LID Handbook 2.2.4
Restrict heavy construction equipment access to planned green/open space areas
<input type="checkbox"/> Re-till soils compacted by construction vehicles/equipment
Collect & re-use upper soil layers of development site containing organic materials
<input type="checkbox"/> Other. Description:
<input checked="" type="checkbox"/> 4. Not feasible. State Reason: THE PROJECT WAS ALREADY MASS-GRADED PER GRADING PERMIT L-15115.
5. Drain Runoff from Impervious Surfaces to Pervious Areas-County LID Handbook 2.2.5

LID Street & Road Design	
<input type="checkbox"/>	Curb-cuts to landscaping
<input type="checkbox"/>	Rural Swales
<input type="checkbox"/>	Concave Median
<input type="checkbox"/>	Cul-de-sac Landscaping Design
<input type="checkbox"/>	Other. Description: N/A
LID Parking Lot Design	
<input type="checkbox"/>	Permeable Pavements
<input type="checkbox"/>	Curb-cuts to landscaping
<input type="checkbox"/>	Other. Description: N/A
LID Driveway, Sidewalk, Bike-path Design	
<input type="checkbox"/>	Permeable Pavements
<input type="checkbox"/>	Pitch pavements toward landscaping
<input checked="" type="checkbox"/>	Other. Description: SHARED DRIVEWAY FOR LOTS 4 & 5. 10' DG TRAIL PROPOSED ALONG SWEETWATER ROAD INSTEAD OF SIDEWALK.
LID Building Design	
<input type="checkbox"/>	Cisterns & Rain Barrels
<input checked="" type="checkbox"/>	Downspout to swale
<input type="checkbox"/>	Vegetated Roofs
<input type="checkbox"/>	Other. Description:
LID Landscaping Design	
<input type="checkbox"/>	Soil Amendments
<input type="checkbox"/>	Reuse of Native Soils
<input type="checkbox"/>	Smart Irrigation Systems
<input type="checkbox"/>	Street Trees
<input checked="" type="checkbox"/>	Other. Description: VEGETATED SWALES EXISTING ON-SITE PER GRADING PERMIT L-15115.
<input type="checkbox"/> 5. Not feasible. State Reason:	



# PRELIMINARY GRADING PLAN FOR: COUNTY OF SAN DIEGO TRACT 5543-RPL1



## LEGAL DESCRIPTION

PARCELS 1 & 4 PER MAP NO. 2513

**ASSESSOR'S PARCEL NO.**  
589-100-36,39

## BASIS OF BEARINGS

PER PARCEL MAP NO. 2513

## ENGINEER:

STUART ENGINEERING  
7525 METROPOLITAN DRIVE, SUITE 308  
SAN DIEGO, CA 92108  
(619) 296-1010

BY: *Brian G. Faraci* 7-20-08  
BRIAN G. FARACI RCE 34618 DATE

## OWNER/SUBDIVIDER:

BONITA PARK ASSOCIATES, LLC & STIVERS RANCH, LLC  
3330 BONITA ROAD  
CHULA VISTA, CA 91910  
(619) 426-0441

## LEGEND

### EXISTING IMPROVEMENTS

BOUNDARY	---
EXISTING CONTOUR (EXIST. OR PER L-15115)	130
WATER LINE	W
SEWER LINE	S
STORM DRAIN LINE	SD
STORM DRAIN INLET/CLEANOUT	□
EXISTING R.O.W.	---
EXISTING VEGETATED SWALE	←
PROPOSED IMPROVEMENTS	
PROPOSED R.O.W.	---
PROPOSED CONTOUR	130
6" CURB & GUTTER	---
PAD	---
STORM DRAIN LINE	---
STORM DRAIN INLET/CLEANOUT	□
SIDEWALK	---
AC PAVING	---
CURB OUTLET (D-25)	---
DIRECTION OF FLOW	→
VEGETATED SWALE	←

## EARTHWORK SUMMARY

CUT = 1,350 C.Y.  
FILL = 1,350 C.Y.

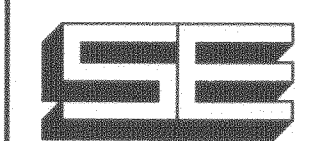
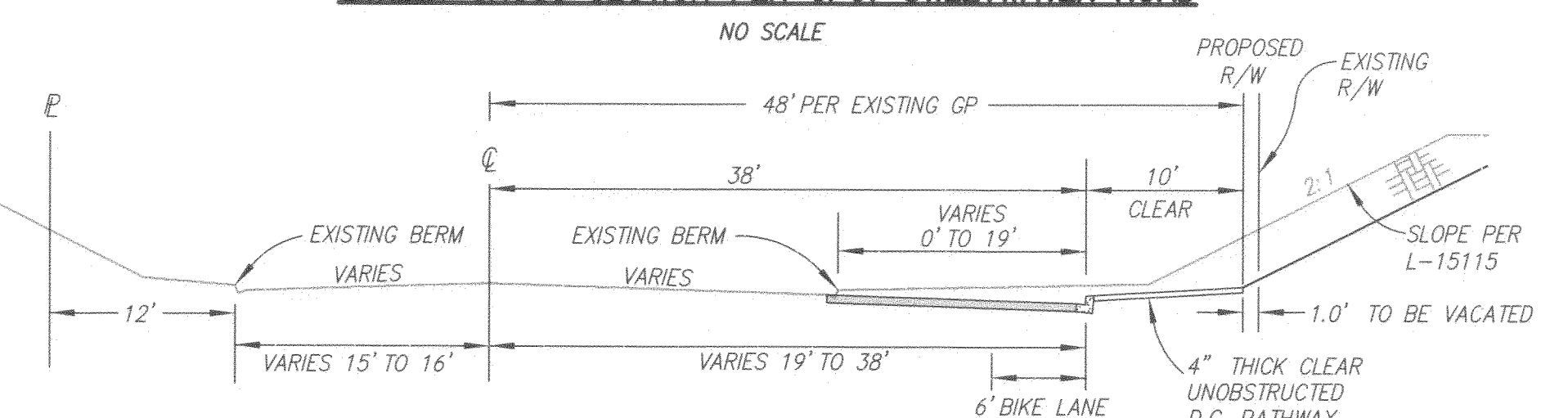
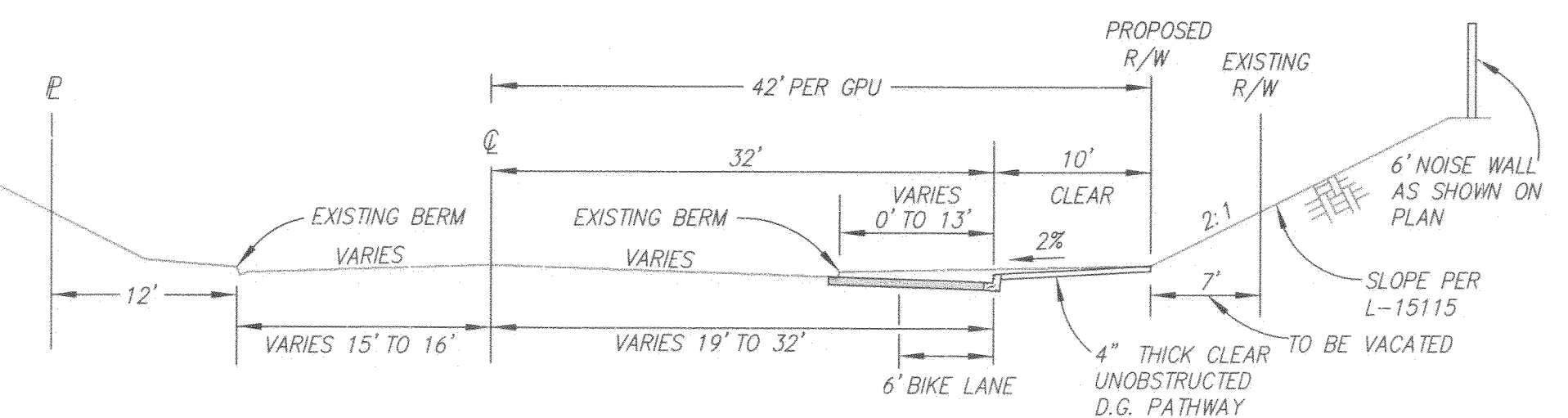
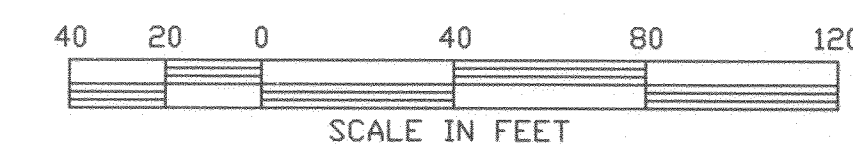
## TOPOGRAPHY:

TOPOGRAPHY COMPILED PER:

APPROVED COUNTY OF SAN DIEGO GRADING PLAN L-15115  
WITH FIELD MODIFICATIONS.

## NOTE:

THIS PLAN IS PROVIDED TO ALLOW FOR FULL AND ADEQUATE DISCRETIONARY REVIEW OF A PROPOSED DEVELOPMENT PROJECT. THE PROPERTY OWNER ACKNOWLEDGES THAT ACCEPTANCE OR APPROVAL OF THIS PLAN DOES NOT CONSTITUTE AN APPROVAL TO PERFORM ANY GRADING SHOWN HEREON, AND AGREES TO OBTAIN A VALID GRADING PERMIT BEFORE COMMENCING SUCH ACTIVITY.



**STUART ENGINEERING**  
7525 METROPOLITAN DRIVE STE. 308  
SAN DIEGO, CA 92108 (619) 296-1010  
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REVISED: JULY 24, 2008  
REVISED: FEBRUARY 21, 2008

DESIGNER: BF  
DRAWN: MJR  
DATE: 9/18/07  
JOB NO.: 312-07-04